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SUBJECT: ARMENIA'S CIVIL NUCLEAR ENERGY PLANS

REF: A) STATE 127468 B) YEREVAN 837

1) In response to Ref A, the Armenian government (GOAM) is in the early stages of planning a new nuclear power plant to replace the aging Soviet-era Armenian Nuclear Power Plant (ANPP) at Metsamor. The GOAM is under international pressure to close ANPP by the end of 2016 due to safety concerns, however, this timeline may have to be extended if the new plant has yet to be finished. Embassy Yerevan maintains regular contact with the GOAM about its plans for replacement of ANPP and in 2008 USAID funded a set of Initial Planning Studies for such a project. Post has reported regularly on the GOAM's plans regarding a replacement for ANPP, most recently in Ref B. Following are the questions in Ref A and post's replies:

2) ARE THERE ANY PLANS TO EXPAND YOUR COUNTRY'S CIVIL NUCLEAR POWER PROGRAM?

The GOAM is planning to replace the existing ANPP with a new nuclear power plant in order to comply with international demands to decommission an aging facility whose design poses a potential threat to public health as well as to the ecology of the region. The current ANPP produces approximately 42 percent of Armenia's total electricity output. As a result, the GOAM is considering various options for building a new facility that would have a 1,000 to 1,200 megawatt (MW) reactor, approximately twice the current reactor's 440 MW capacity. This level of capacity factors increasing energy demand within the Armenian economy over the plant's life, and the possibility of energy sales to neighboring countries.

3) FOR EXPANDING NUCLEAR POWER PROGRAMS, DESCRIBE YOUR COUNTRY'S UNDERLYING MOTIVATIONS.

The primary motivation for a new nuclear power plant in Armenia is energy security, as Armenia has poor energy resources and faces a de facto blockade by two of its neighbors. Currently, Armenia is forced to import all of its natural gas from Russia and Iran, and receives its refined petroleum through Georgia. During the early 1990s, the ANPP was closed down following the 1988 Spitak earthquake, and for several years the country was reduced to just several hours of electricity per day. One of the two reactors was reopened in 1995 with Russian assistance and remains in operation.

Armenia relies on ANPP for up to 42 percent of its electricity, with gas-powered thermal and hydroelectric generation comprising 25-30 percent each. The 2006 Least Cost Generation Plan (LCGP) concluded that a new nuclear unit is the least cost option for replacing such a large percentage of the country's electricity demand, particularly given the likelihood of steadily increasing prices for natural gas from abroad. In 2007, the LCGP was adopted by GOA as consistent with its energy strategy.

4) IF THERE ARE PLANS TO EXPAND NUCLEAR POWER, DESCRIBE THE GOVERNMENT'S ROLE IN THE FINANCING OF ITS CIVIL NUCLEAR SECTOR.

A new nuclear power plant is projected to cost approximately USD 6-7 billion, equal to nearly 60-70 percent of Armenia's GDP. The GOAM does not have the financial resources to build a new power plant, and will need to rely on a combination of private sector investment, debt financing, foreign government export credits and foreign assistance to finance construction of a new facility.

5) DESCRIBE YOUR COUNTRY'S NUCLEAR REGULATORY AUTHORITY.

Nuclear power in Armenia is regulated by the State Committee for

Regulation of Nuclear Safety, known under its longtime acronym, ANRA (for its old name, the Armenian Nuclear Regulatory Authority). It is an executive agency which implements State regulation in the use of atomic energy, including the safety of the population and nuclear personnel, environmental protection and Republic of Armenia's security interests.

6) DOES YOUR COUNTRY HAVE A DOMESTIC NUCLEAR LIABILITY LAW?

Armenia has a law on Safe Utilization of Atomic Energy for Peaceful Purposes. The Law specifies relations in state regulation of atomic energy utilization field, safety of nuclear facilities and other relations in atomic energy utilization with the purpose to protect personnel, public and environment, as well as the safety related interest of ROA.

7) IS THE MANUFACTURING BASE IN YOUR COUNTRY INVOLVED IN NUCLEAR-RELATED PRODUCTS OR SERVICES?

Armenia does not have an industrial base capable of producing any of the specialized elements of a nuclear power plant. All of the major items will need to be imported. In addition, the GOAM will need to assess and if needed undertake modifications to a number of roads, railways and bridges in order to accommodate some of the larger-size components as they are transported to the site. Lastly a national radioactive waste management strategy should be defined for Armenia based on IAEA waste management requirements and guidelines to define expected technologies and locations for storage and disposal of radioactive waste from ANPP Units 1, 2 and 3.

8) HOW EXTENSIVE IS YOUR COUNTRY'S NUCLEAR-TRAINED WORKFORCE?

A large part of Armenia's nuclear plant operating personnel are nearing retirement, with a limited supply of replacements coming through the system. The GOAM has recognized this as a potential problem and with help from educational institutions and ANPP officials is taking steps to attract more students to the field of nuclear physics and engineering. Currently, the GOAM is working with the IAEA on a training and staffing assessment, which is nearing completion. A functional task analysis approach is being used to identify the tasks and competencies needed for each phase of the NPP project: Initial Planning, Preparation, Construction, Commissioning and Operation. They are also conducting a survey of human resources in existing engineering organizations in Armenia (e.g., ANPP, CJSC Atomservice, CJSC Armatom), preparing a survey of technical training institutions in Armenia, and making recommendations for human resource development and training.

The country will need to make a concerted effort to train new skilled plant operators if it is to meet the needs of a new ANPP. Construction of a nuclear power plant will likely entail recruitment of the majority of the skilled workforce in Armenia. The Initial Planning Studies also anticipate that there will be considerable infrastructure requirements to support an imported workforce--including homes and schools--during the construction of the project.

9) DOES YOUR COUNTRY HAVE ANY CURRENT OR ANTICIPATED NUCLEAR-RELATED TENDERS?

There are no current tenders, but the Government is moving forward expeditiously towards a tender. The GOAM plans to issue tenders in 2009 for early-stage financial and design consulting. More specifically, on December 25, 2008 the Armenian Prime Minister, Tigran Sargsyan, headed a government session during which the Government passed a bill on "Construction of new nuclear energy blocks in Armenia", which will be presented to the RA National Assembly. In a second resolution, the government approved the contest package for the "Selection of the company in charge of the construction of the new nuclear energy block" and confirmed the staff of the inter-ministerial contest committee. The Prime Minister assigned RA Energy and Natural Resources Minister Armen Movsisian to make an official announcement regarding the international contest 15 days after the official record of purchases.

10) WHAT NUCLEAR SECTOR OPPORTUNITIES DO YOU FORESEE FOR U.S. INDUSTRY?

There are potential opportunities for design, engineering, equipment and financing firms. One of the three designs being actively considered by the GOAM for the new nuclear unit is a Westinghouse product. Moreover, GOAM officials have repeatedly expressed interest in working with firms from a variety of western countries in the development of a new nuclear power plant. Nonetheless, given the large role played by Russian firms in Armenia's energy sector -- including its debt to Russia for restarting the existing plant - there is considerable expectation that Armenia will turn to Russia to build a significant portion of the new plant, including reactors and other central infrastructure. While Russian firms have expressed strong interest in engaging in the nuclear plant in Armenia, more practically they are very busy with projects in other countries. This could stretch their ability to finance or deliver a new plant to Armenia under the current delivery schedule.

11) WHAT ARE THE PRIMARY COMPANIES INVOLVED IN YOUR COUNTRY'S CIVIL NUCLEAR SECTOR?

Since the ANPP is wholly owned by the GOAM, the primary companies involved in selling to and servicing its needs are either affiliated with the government or are international contractors affiliated with foreign government nuclear safety and assistance programs. The existing engineering organizations in Armenia working on nuclear matters include ANPP, CJSC Atomservice, and CJSC Atomatom. A number of European (nuclear safety and decommissioning) and Russian companies (fuel supply and management service) are providing services to ANPP, as well as U.S. National Laboratories and their subcontractors (safety upgrades).

12) ARE THERE OTHER NUCLEAR SUPPLIER COUNTRIES ENGAGING YOUR COUNTRY ON ITS CIVIL NUCLEAR POWER PROGRAM?

Yes--Russia, France, the Czech Republic and the UK. As previously noted, Russia is the supplier of nuclear fuel and has provided management services. A French firm (Framatom) supplies equipment for ANPP's dry storage for spent nuclear fuel. A Czech company is conducting some of the ultrasound testing under a USDOE subcontract. The UK has provided safety support to Armenia under the Armenian government's nuclear safety program.

13) ARE THERE ANY POLITICAL CONSIDERATIONS YOUR COUNTRY MAY TAKE INTO ACCOUNT WHEN CHOOSING TO COOPERATE WITH COMPETING NUCLEAR SUPPLIER STATES?

The GOAM works to maintain friendly relations with both the United States and Russia, and consequently is likely to engage suppliers from both countries - as well as from Western Europe -in development of a new plant.

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